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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,012	06/13/2005	Masahiro Morooka	S1459.70047US00	6931
23628	7590	11/20/2009	EXAMINER	
WOLF GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206			BALL, JOHN C	
ART UNIT	PAPER NUMBER	1795		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/511,012	<b>Applicant(s)</b> MOROOKA ET AL.
	<b>Examiner</b> J. CHRISTOPHER BALL	<b>Art Unit</b> 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 14 July 2009.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-14 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_

5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Summary***

1. This Office Action is based on the Amendment filed with the Office on July 14, 2009, regarding the MOROOKA et al. application.
2. Claims 1-14 are currently pending and have been fully considered.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by YONEHARA et al., an English translation of a Japanese Patent Application Publication (2000-306605, A), submitted to the Office on an Informational Disclosure Statement.

Regarding claim 1, YONEHARA discloses a solid electrolyte for use in electrical system, wherein is taught the method of forming an electrolyte comprising:

forming a matrix polymer by polymerizing a first compound having at least two isocyanate groups (compounds containing diisocyanate groups, paragraphs [0058] and [0070]) and a second compound having at least two nucleophilic groups containing active hydrogen (material containing alkylene glycol derivatives; claim 2),

said polymerization being preformed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is to be formed (paragraph [0109]); wherein the electrolyte layer (2, Drawing 1) is formed between two electrodes (1 and 3, Drawing 1).

Regarding claims 2 and 4, YONEHARA teaches the electrolyte composition comprises a solvent, including an ionic liquid, to form a gel electrolyte (paragraph [0100]).

Regarding claim 3, YONEHARA teaches the electrolyte composition comprises no solvent to form a solid electrolyte (paragraph [0102]).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over YONEHARA et al., an English translation of a Japanese Patent Application Publication (2000-306605, A), submitted to the Office on an Informational Disclosure Statement, in view of SHACKLE (WO 97/08719).

Regarding claims 5-7, YONEHARA teaches the limitations of claim 1, as outlined above.

YONEHARA does not explicitly teach the electrolyte composition comprises a redox couple.

However, SHACKLE discloses a photoelectrochemical cell, wherein is taught an electrolyte that is formed comprising a redox couple of LiI and I<sub>2</sub> (lines 7-8, page 16).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the method of forming an electrolyte as taught

by YONEHARA to include the step of adding the LiI/I<sub>2</sub> redox couple into the electrolyte as taught by SHACKLE because it will allow the solid electrolyte to be suitable for use in photoelectrochemical cells (SHACKLE, lines 13-15, page 1).

8. Claims 8 -14 are rejected under 35 U.S.C. 103(a) as being unpatentable over NAKAMURA (US 6,291,763 B1) in view of TAKEYAMA et al. (US 4,902,440).

Regarding claim 8, NAKAMURA discloses a photocell comprising: a semiconductor layer composed of semiconductor particles carrying a dye (3, Figure 1; Col. 5, lines 14-15; Col. 29, lines 43-45) and an electrolyte layer (5, Figure 1), the layers being provided between a counter electrode (6, Figure 1) and an electrode (2, Figure 1) formed on a surface of a substrate (1, Figure 1); where the electrolyte layer has a redox couple (Col. 25, lines 18-28), an electrolyte composition (Col. 25, lines 44-46), and a matrix polymer (Col. 26, lines 16-19).

While NAKAMURA teaches several particular matrix polymers, NAKAMURA does not explicitly teach the matrix polymer is formed by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen atoms.

However, TAKEYAMA discloses UV-curable polymers wherein is taught a polymer is formed by polymerization of a first compound having at least two isocyanate groups, in the form of tolylene diisocyanate, and a second compound having at least two nucleophilic groups containing active hydrogen atoms, in the form of polytetramethylene glycol (Col. 9, line 65 – Col. 10, line 18).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the photocell as taught by NAKAMURA by utilizing the polymer as taught by TAKEYAMA because the polymer taught by TAKEYAMA would be a simple substitution of one known element for another known element with a predictable expectation of success (*KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_, 82 USPQ2d 1385 (2007)).

Regarding claim 9, NAKAMURA teaches the substrate is glass, which is transparent (Col. 34, lines 29-30).

Regarding claim 10, NAKAMURA discloses a method for manufacturing a photocell, comprising:

injecting a mixed solution between a counter electrode (6, Figure 1) and an electrode (2, Figure 1) formed on a substrate (1, Figure 1), and polymerizing the mixed solution after it is brought into contact with electrode formed on the surface of the substrate (Col. 28, line 63 - Col. 29, line 3).

While NAKAMURA teaches several particular matrix polymers, NAKAMURA does not explicitly teach the matrix polymer is formed by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen atoms.

However, TAKEYAMA discloses UV-curable polymers wherein is taught a polymer is formed by polymerization of a first compound having at least two isocyanate groups, in the form of tolylene diisocyanate, and a second compound having at least two nucleophilic groups containing active hydrogen atoms, in the form of polytetramethylene glycol (Col. 9, line 65 – Col. 10, line 18).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the photocell as taught by NAKAMURA by utilizing the polymer as taught by TAKEYAMA because the polymer taught by TAKEYAMA would be a simple substitution of one known element for another known element with a predictable expectation of success (*KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_, 82 USPQ2d 1385 (2007)).

Regarding claim 11, NAKAMURA teaches a semiconductor layer composed of semiconductor particles carrying a dye (3, Figure 1; Col. 5, lines 14-15; Col. 29, lines 43-45) being provided between a counter electrode (6, Figure 1) and an electrode (2, Figure 1) formed on a surface of a substrate (1, Figure 1).

Regarding claim 12, NAKAMURA as modified by TAKEYAMA teaches a polymer is formed by polymerization of a first compound having at least two isocyanate groups, in the form of tolylene diisocyanate, and a second compound having at least two nucleophilic groups containing active hydrogen atoms, in the form of polytetramethylene glycol (TAKEYAMA, Col. 9, line 65 – Col. 10, line 18). These compounds would inherently result in a Michael addition reaction upon polymerization.

Regarding claim 13, NAKAMURA teaches the electrolyte composition has a redox couple (Col. 25, lines 18-28).

Regarding claim 14, NAKAMURA discloses a method for manufacturing a photocell, comprising:

forming a semiconductor layer composed of semiconductor particles carrying a dye (3, Figure 1; Col. 5, lines 14-15; Col. 29, lines 43-45) being provided between a counter electrode (6, Figure 1) and an electrode (2, Figure 1) formed on a surface of a substrate (1, Figure 1); and polymerizing compounds after they are brought into contact with electrode formed on the surface of the substrate (Col. 28, line 63 - Col. 29, line 3).

While NAKAMURA teaches several particular matrix polymers, NAKAMURA does not explicitly teach the matrix polymer is formed by polymerization of a first compound having at least two isocyanate groups and a

second compound having at least two nucleophilic groups containing active hydrogen atoms.

However, TAKEYAMA discloses UV-curable polymers wherein is taught a polymer is formed by polymerization of a first compound having at least two isocyanate groups, in the form of tolylene diisocyanate, and a second compound having at least two nucleophilic groups containing active hydrogen atoms, in the form of polytetramethylene glycol (Col. 9, line 65 – Col. 10, line 18).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the photocell as taught by NAKAMURA by utilizing the polymer as taught by TAKEYAMA because the polymer taught by TAKEYAMA would be a simple substitution of one known element for another known element with a predictable expectation of success (*KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_, 82 USPQ2d 1385 (2007)).

***Response to Arguments***

9. Applicant's arguments, see Remarks, p. 5, filed July 14, 2009, with respect to claims 1, 2, and 4-14 rejected by FURUMIYA have been fully considered and are persuasive. The rejection of claims 1, 2, and 4-14 based on FURUMIYA has been withdrawn.

10. Applicant's arguments filed regarding utilization of YONEHARA to reject claim 1 have been fully considered but they are not persuasive. Applicants assert that YONEHARA does not teach the new limitation in claim 1, namely that YONEHARA does not teach "wherein the electrolyte layer is formed between two electrodes". However, as clearly shown in Drawing 1 of YONEHARA, the electrolyte layer is shown between two electrodes. Therefore, the argument claim 1 is patentable over YONEHARA is not persuasive.

#### ***Conclusion***

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. CHRISTOPHER BALL whose telephone number is (571)270-5119. The examiner can normally be reached on Monday through Thursday, 9 am to 5 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit 1753

JCB  
11/18/2009